**Amendments to the Claims:**

This listing of claims will replace all prior versions of claims in the application:

1-41 (canceled)

42. (new) A method for characterizing animal behavior, comprising:

segregating images of an animal from video images of the animal in a behavioral analysis apparatus, wherein the video images are taken from a top view;

identifying at least one body part of the animal;

identifying a center of mass of the animal; and

characterizing behavior of the animal using the at least one body part and the center of mass of the animal.

43. (new) The method of claim 42, wherein segregating images of an animal from video images includes subtracting a background image from a video image containing an image of an animal.

44. (new) The method of claim 42, wherein characterizing behavior of the animal includes comparing a location of the at least one body part of the animal and a location of the center of mass of the animal to pre-trained behavior models.

45. (new) The method of claim 42, wherein characterizing behavior of the animal includes comparing a location of the at least one body part of the animal and a location of the center of mass of the animal to predefined rules.

46. (new) The method of claim 42, wherein characterizing the behavior of the animal includes determining the location of the at least one body part of the animal in relation to a user-defined virtual zone.

47. (new) The method of claim 42, wherein characterizing the behavior of the animal includes determining the location of the center of mass of the animal in relation to a user-defined virtual zone.

48. (new) The method of claim 42, wherein the at least one body part is a head.

49. (new) The method of claim 42, wherein the at least one body part is a tail.

50. (new) The method of claim 42, wherein the at least one body part is a waist.

51. (new) The method of claim 42, wherein the at least one body part is a fore body.

52. (new) The method of claim 42, wherein the at least one body part is a hind body.

53. (new) The method of claim 42, wherein the behavior analysis apparatus is an open field apparatus.

54. (new) The method of claim 42, wherein the behavior analysis apparatus is a maze apparatus.

55. (new) The method of claim 42, wherein the behavior analysis apparatus includes recognition objects.

56. (new) The method of claim 42, wherein the behavior analysis apparatus includes a fear chamber.

57. (new) A method for characterizing animal behavior, comprising:

segregating images of an animal from video images of the animal in a behavioral analysis apparatus, wherein the video images are taken from a top view;

identifying at least one body part of the animal;

identifying a center of mass of the animal; and

detecting behavioral events of the animal using the at least one body part and the center of mass of the animal.

58. (new) The method of claim 57, wherein detecting behavior events includes comparing a location of the at least one body part of the animal and a location of the center of mass of the animal to pre-trained behavior models.

59. (new) The method of claim 57, wherein detecting behavioral events includes comparing a location of the at least one body part of the animal and a location of the center of mass of the animal to predefined rules.

60. (new) The method of claim 57, wherein detecting behavioral events includes detecting a turning ratio of the animal by taking a ratio of a path length traveled over a number of turns, wherein a turn is counted when the animal makes a turn larger than ninety degrees when the animal travels one body length.

61. (new) The method of claim 57, wherein detecting behavioral events includes detecting sniffing behavior of the animal by detecting when the animal's nose is in contact with a recognition object in the behavioral analysis apparatus.

62. (new) The method of claim 57, wherein detecting behavioral events includes detecting stretch-and-attend by detecting the animal's approach to an object with fore body stretched and then lowered, followed by retraction of the fore body.

63. (new) The method of claim 57, wherein detecting behavioral events includes detecting stay-across-areas by detecting the animal's partial incursions into a zone of the behavioral analysis apparatus.

64. (new) The method of claim 57, wherein detecting behavioral events includes detecting head dipping by detecting the animal's exploratory movement of its head over an edge of the behavioral analysis apparatus.

65. (new) The method of claim 57, wherein detecting behavioral events includes detecting freezing by detecting an absence of movement of the animal's body for a period of time.

66. (new) The method of claim 57, wherein detecting behavioral events includes detecting locomoting by detecting movement of the animal within the behavioral analysis apparatus.

67. (new) The method of claim 57, wherein detecting behavioral events includes detecting transgressing behavior by detecting movement of the animal from a defined zone within the behavioral analysis apparatus to another defined zone within the behavioral analysis apparatus.

68. (new) The method of claim 57, wherein detecting behavioral events includes calculating a proximity score by determining a distance of the animal from a goal at predetermined time intervals.

69. (new) The method of claim 57, wherein detecting behavioral events includes determining heading errors by detecting when the animal is moving away from a goal.

70. (new) The method of claim 57, wherein the at least one body part is a head.

71. (new) The method of claim 57, wherein the at least one body part is a tail.

72. (new) The method of claim 57, wherein the at least one body part is a waist.

73. (new) The method of claim 57, wherein the at least one body part is a fore body.

74. (new) The method of claim 57, wherein the at least one body part is a hind body.

75. (new) A computer-readable medium including instructions for performing:

segregating images of an animal from video images of the animal in a behavioral analysis apparatus, wherein the video images are taken from a top view;

identifying at least one body part of the animal;

identifying a center of mass of the animal; and

characterizing behavior of the animal using the at least one body part and the center of mass of the animal.

76. (new) The computer-readable medium of claim 75, wherein characterizing behavior of the animal includes comparing a location of the at least one body part of the animal and a location of the center of mass of the animal to pre-trained behavior models.

77. (new) The computer-readable medium of claim 75, wherein characterizing behavior of the animal includes comparing a location of the at least one body part of the animal and a location of the center of mass of the animal to predefined rules.

78. (new) The computer-readable medium of claim 75, wherein the at least one body part is a head.

79. (new) The computer-readable medium of claim 75, wherein the at least one body part is a tail.

80. (new) The computer-readable medium of claim 75, wherein the at least one body part is a waist.

81. (new) The computer-readable medium of claim 75, wherein the at least one body part is a fore body.

82. (new) The computer-readable medium of claim 75, wherein the at least one body part is a hind body.